



#5

## SEQUENCE LISTING

<110> Harrison, Leonard C.  
Jiang, Fang-Xu  
Stanley, Edouard Guy  
Gonez, Leonel Jorge

<120> Pancreatic islet cell growth factors

<130> Davies Collison Cave

<140> 09/784,911

<141> 2001-02-16

<160> 30

<170> PatentIn version 2.1

<210> 1

<211> 1260

<212> DNA

<213> mouse

<220>

<221> CDS

<222> (1)..(1260)

<220>

<221> UNSURE

<222> (186)

<223> Xaa at position 186 is Tyr or His

<400> 1

atg gcg cgc ctg atg att cct ggt aac cga atg ctg atg gtc gtt tta 48  
Met Ala Arg Leu Met Ile Pro Gly Asn Arg Met Leu Met Val Val Leu  
1 5 10 15

tta tgc caa gtc ctg cta gga ggc gcg agc cat gct agt ttg ata cct 96  
Leu Cys Gln Val Leu Leu Gly Gly Ala Ser His Ala Ser Leu Ile Pro  
20 25 30

gag acc ggg aag aaa aaa gtc gcc gag att cag ggc cac gcg gga gga	144
Glu Thr Gly Lys Lys Lys Val Ala Glu Ile Gln Gly His Ala Gly Gly	
35 40 45	
cgc cgc tca ggg cag agc cat gag ctc ctg cgg gac ttc gag gcg aca	192
Arg Arg Ser Gly Gln Ser His Glu Leu Leu Arg Asp Phe Glu Ala Thr	
50 55 60	
ctt cta cag atg ttt ggg ctg cgc cgc cgt ccg cag cct agc aag agc	240
Leu Leu Gln Met Phe Gly Leu Arg Arg Arg Pro Gln Pro Ser Lys Ser	
65 70 75 80	
gcc gtc att ccg gat tac atg agg gat ctt tac cgg ctc cag tct ggg	288
Ala Val Ile Pro Asp Tyr Met Arg Asp Leu Tyr Arg Leu Gln Ser Gly	
85 90 95	
gag gag gag gag gaa gag cag agc cag gga acc ggg ctt gag tac ccg	336
Glu Glu Glu Glu Glu Glu Gln Ser Gln Gly Thr Gly Leu Glu Tyr Pro	
100 105 110	
gag cgt ccc gcc agc cga gcc aac act gtg agg agt ttc cat cac gaa	384
Glu Arg Pro Ala Ser Arg Ala Asn Thr Val Arg Ser Phe His His Glu	
115 120 125	
gaa cat ctg gag aac atc cca ggg acc agt gag agc tct gct ttt cgt	432
Glu His Leu Glu Asn Ile Pro Gly Thr Ser Glu Ser Ser Ala Phe Arg	
130 135 140	
ttc ctc ttc aac ctc agc agc atc cca gaa aat gag gtg atc tcc tcg	480
Phe Leu Phe Asn Leu Ser Ser Ile Pro Glu Asn Glu Val Ile Ser Ser	
145 150 155 160	
gca gag ctc cgg ctc ttt cgg gag cag gtg gac cag ggc cct gac tgg	528
Ala Glu Leu Arg Leu Phe Arg Glu Gln Val Asp Gln Gly Pro Asp Trp	
165 170 175	
gaa cag ggc ttc cac cgt ata aac att yat gag gtt atg aag ccc cca	576
Glu Gln Gly Phe His Arg Ile Asn Ile Xaa Glu Val Met Lys Pro Pro	
180 185 190	

gca gaa atg gtt cct gga cac ctc atc aca cga cta ctg gac acc aga	624
Ala Glu Met Val Pro Gly His Leu Ile Thr Arg Leu Leu Asp Thr Arg	
195 200 205	
cta gtc cat cac aat gtg aca cgg tgg gaa act ttc gat gtg agc cct	672
Leu Val His His Asn Val Thr Arg Trp Glu Thr Phe Asp Val Ser Pro	
210 215 220	
gca gtc ctt cgc tgg acc cgg gaa aag caa ccc aat tat ggg ctg gcc	720
Ala Val Leu Arg Trp Thr Arg Glu Lys Gln Pro Asn Tyr Gly Leu Ala	
225 230 235 240	
att gag gtg act cac ctc cac cag aca cgg acc cac cag ggc cag cat	768
Ile Glu Val Thr His Leu His Gln Thr Arg Thr His Gln Gly Gln His	
245 250 255	
gtc aga atc agc cga tcg tta cct caa ggg agt gga gat tgg gcc caa	816
Val Arg Ile Ser Arg Ser Leu Pro Gln Gly Ser Gly Asp Trp Ala Gln	
260 265 270	
ctc cgg ccc ctc ctg gtc act ttt ggc cat gat ggc cgg ggc cat acc	864
Leu Arg Pro Leu Leu Val Thr Phe Gly His Asp Gly Arg Gly His Thr	
275 280 285	
ttg acc cgc agg agg gcc aaa cgt agt ccc aag acg cgc cag gag gag	912
Leu Thr Arg Arg Arg Ala Lys Arg Ser Pro Lys Thr Arg Gln Glu Glu	
290 295 300	
gaa tac atg ccc atg gag acg cgt agg aag aag aat aag aac tgc cgt	960
Glu Tyr Met Pro Met Glu Thr Arg Arg Lys Lys Asn Lys Asn Cys Arg	
305 310 315 320	
cgc cat tca cta tac gtg gac ttc agt gac gtg ggc tgg aat gat tgg	1008
Arg His Ser Leu Tyr Val Asp Phe Ser Asp Val Gly Trp Asn Asp Trp	
325 330 335	
att gtg gcc cca ccc ggc tac cag gcc ttc tac tgc cat ggg gac tgt	1056
Ile Val Ala Pro Pro Gly Tyr Gln Ala Phe Tyr Cys His Gly Asp Cys	
340 345 350	
ccc ttt cca ctg gct gat cac ctc aac tca acc aac cat gcc att gtg	1104

Pro Phe Pro Leu Ala Asp His Leu Asn Ser Thr Asn His Ala Ile Val  
 355 360 365

cag acc cta gtc aac tct gtt aat tct agt atc cct aag gcc tgt tgt 1152  
 Gln Thr Leu Val Asn Ser Val Asn Ser Ser Ile Pro Lys Ala Cys Cys  
 370 375 380

gtc ccc act gaa ctg agt gcc att tcc atg ttg tac ctg gat gag tat 1200  
 Val Pro Thr Glu Leu Ser Ala Ile Ser Met Leu Tyr Leu Asp Glu Tyr  
 385 390 395 400

gac aag gtg gtg ttg aaa aat tat cag gag atg gtg gta gag ggg tgt 1248  
 Asp Lys Val Val Leu Lys Asn Tyr Gln Glu Met Val Val Glu Gly Cys  
 405 410 415

gga tgc cgc tga 1260  
 Gly Cys Arg

<210> 2  
 <211> 419  
 <212> PRT  
 <213> mouse

<220>  
 <221> UNSURE  
 <222> (186)  
 <223> Xaa at position 186 is Tyr or His

<400> 2

Met Ala Arg Leu Met Ile Pro Gly Asn Arg Met Leu Met Val Val Leu  
 1 5 10 15

Leu Cys Gln Val Leu Leu Gly Gly Ala Ser His Ala Ser Leu Ile Pro  
 20 25 30

Glu Thr Gly Lys Lys Lys Val Ala Glu Ile Gln Gly His Ala Gly Gly  
35 40 45

Arg Arg Ser Gly Gln Ser His Glu Leu Leu Arg Asp Phe Glu Ala Thr  
50 55 60

Leu Leu Gln Met Phe Gly Leu Arg Arg Arg Pro Gln Pro Ser Lys Ser  
65 70 75 80

Ala Val Ile Pro Asp Tyr Met Arg Asp Leu Tyr Arg Leu Gln Ser Gly  
85 90 95

Glu Glu Glu Glu Glu Glu Gln Ser Gln Gly Thr Gly Leu Glu Tyr Pro  
100 105 110

Glu Arg Pro Ala Ser Arg Ala Asn Thr Val Arg Ser Phe His His Glu  
115 120 125

Glu His Leu Glu Asn Ile Pro Gly Thr Ser Glu Ser Ser Ala Phe Arg  
130 135 140

Phe Leu Phe Asn Leu Ser Ser Ile Pro Glu Asn Glu Val Ile Ser Ser  
145 150 155 160

Ala Glu Leu Arg Leu Phe Arg Glu Gln Val Asp Gln Gly Pro Asp Trp  
165 170 175

Glu Gln Gly Phe His Arg Ile Asn Ile Xaa Glu Val Met Lys Pro Pro  
180 185 190

Ala Glu Met Val Pro Gly His Leu Ile Thr Arg Leu Leu Asp Thr Arg  
195 200 205

Leu Val His His Asn Val Thr Arg Trp Glu Thr Phe Asp Val Ser Pro  
 210 215 220

Ala Val Leu Arg Trp Thr Arg Glu Lys Gln Pro Asn Tyr Gly Leu Ala  
 225 230 235 240

Ile Glu Val Thr His Leu His Gln Thr Arg Thr His Gln Gly Gln His  
 245 250 255

Val Arg Ile Ser Arg Ser Leu Pro Gln Gly Ser Gly Asp Trp Ala Gln  
 260 265 270

Leu Arg Pro Leu Leu Val Thr Phe Gly His Asp Gly Arg Gly His Thr  
 275 280 285

Leu Thr Arg Arg Arg Ala Lys Arg Ser Pro Lys Thr Arg Gln Glu Glu  
 290 295 300

Glu Tyr Met Pro Met Glu Thr Arg Arg Lys Lys Asn Lys Asn Cys Arg  
 305 310 315 320

Arg His Ser Leu Tyr Val Asp Phe Ser Asp Val Gly Trp Asn Asp Trp  
 325 330 335

Ile Val Ala Pro Pro Gly Tyr Gln Ala Phe Tyr Cys His Gly Asp Cys  
 340 345 350

Pro Phe Pro Leu Ala Asp His Leu Asn Ser Thr Asn His Ala Ile Val  
 355 360 365

Gln Thr Leu Val Asn Ser Val Asn Ser Ser Ile Pro Lys Ala Cys Cys  
 370 375 380

Val Pro Thr Glu Leu Ser Ala Ile Ser Met Leu Tyr Leu Asp Glu Tyr  
 385 390 395 400

Asp Lys Val Val Leu Lys Asn Tyr Gln Glu Met Val Val Glu Gly Cys  
 405 410 415

Gly Cys Arg

<210> 3  
 <211> 1362  
 <212> DNA  
 <213> mouse

<220>  
 <221> CDS  
 <222> (1) .. (1311)

<220>  
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 <222> (186)  
 <223> Xaa at position 186 is Tyr or His

<400> 3  
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 Met Ala Arg Leu Met Ile Pro Gly Asn Arg Met Leu Met Val Val Leu  
 1 5 10 15  
 tta tgc caa gtc ctg cta gga ggc gcg agc cat gct agt ttg ata cct 96  
 Leu Cys Gln Val Leu Leu Gly Gly Ala Ser His Ala Ser Leu Ile Pro  
 20 25 30  
 gag acc ggg aag aaa aaa gtc gcc gag att cag ggc cac gcg gga gga 144  
 Glu Thr Gly Lys Lys Lys Val Ala Glu Ile Gln Gly His Ala Gly Gly  
 35 40 45  
 cgc cgc tca ggg cag agc cat gag ctc ctg cgg gac ttc gag gcg aca 192  
 Arg Arg Ser Gly Gln Ser His Glu Leu Leu Arg Asp Phe Glu Ala Thr  
 50 55 60  
 ctt cta cag atg ttt ggg ctg cgc cgc cgt ccg cag cct agc aag agc 240  
 Leu Leu Gln Met Phe Gly Leu Arg Arg Arg Pro Gln Pro Ser Lys Ser  
 65 70 75 80  
 gcc gtc att ccg gat tac atg agg gat ctt tac cgg ctc cag tct ggg 288  
 Ala Val Ile Pro Asp Tyr Met Arg Asp Leu Tyr Arg Leu Gln Ser Gly  
 85 90 95  
 gag gag gag gag gaa gag cag agc cag gga acc ggg ctt gag tac ccg 336

Glu Glu Glu Glu Glu Glu Gln Ser Gln Gly Thr Gly Leu Glu Tyr Pro	
100 105 110	
gag cgt ccc gcc agc cga gcc aac act gtg agg agt ttc cat cac gaa	384
Glu Arg Pro Ala Ser Arg Ala Asn Thr Val Arg Ser Phe His His Glu	
115 120 125	
gaa cat ctg gag aac atc cca ggg acc agt gag agc tct gct ttt cgt	432
Glu His Leu Glu Asn Ile Pro Gly Thr Ser Glu Ser Ser Ala Phe Arg	
130 135 140	
ttc ctc ttc aac ctc agc agc atc cca gaa aat gag gtg atc tcc tcg	480
Phe Leu Phe Asn Leu Ser Ser Ile Pro Glu Asn Glu Val Ile Ser Ser	
145 150 155 160	
gca gag ctc cgg ctc ttt cgg gag cag gtg gac cag ggc cct gac tgg	528
Ala Glu Leu Arg Leu Phe Arg Glu Gln Val Asp Gln Gly Pro Asp Trp	
165 170 175	
gaa cag ggc ttc cac cgt ata aac att yat gag gtt atg aag ccc cca	576
Glu Gln Gly Phe His Arg Ile Asn Ile Xaa Glu Val Met Lys Pro Pro	
180 185 190	
gca gaa atg gtt cct gga cac ctc atc aca cga cta ctg gac acc aga	624
Ala Glu Met Val Pro Gly His Leu Ile Thr Arg Leu Leu Asp Thr Arg	
195 200 205	
cta gtc cat cac aat gtg aca cgg tgg gaa act ttc gat gtg agc cct	672
Leu Val His His Asn Val Thr Arg Trp Glu Thr Phe Asp Val Ser Pro	
210 215 220	
gca gtc ctt cgc tgg acc cgg gaa aag caa ccc aat tat ggg ctg gcc	720
Ala Val Leu Arg Trp Thr Arg Glu Lys Gln Pro Asn Tyr Gly Leu Ala	
225 230 235 240	
att gag gtg act cac ctc cac cag aca cgg acc cac cag ggc cag cat	768
Ile Glu Val Thr His Leu His Gln Thr Arg Thr His Gln Gly Gln His	
245 250 255	
gtc aga atc agc cga tcg tta cct caa ggg agt gga gat tgg gcc caa	816



Val Arg Ile Ser Arg Ser Leu Pro Gln Gly Ser Gly Asp Trp Ala Gln	
260 265 270	
ctc cgg ccc ctc ctg gtc act ttt ggc cat gat ggc cgg ggc cat acc	864
Leu Arg Pro Leu Leu Val Thr Phe Gly His Asp Gly Arg Gly His Thr	
275 280 285	
ttg acc cgc agg agg gcc aaa cgt agt ccc aag acg cgc cag gag gag	912
Leu Thr Arg Arg Arg Ala Lys Arg Ser Pro Lys Thr Arg Gln Glu Glu	
290 295 300	
gaa tac atg ccc atg gag acg cgt acc cag tcg cag gac gtg tcc cgg	960
Glu Tyr Met Pro Met Glu Thr Arg Thr Gln Ser Gln Asp Val Ser Arg	
305 310 315 320	
ggc tcc ggt tct tca gac tac aac ggc agt gag tta aaa aca gct tgc	1008
Gly Ser Gly Ser Ser Asp Tyr Asn Gly Ser Glu Leu Lys Thr Ala Cys	
325 330 335	
aag aag cat gag ctc tat gtg agc ttc cag gac ctg gga tgg cag gac	1056
Lys Lys His Glu Leu Tyr Val Ser Phe Gln Asp Leu Gly Trp Gln Asp	
340 345 350	
tgg atc att gca ccc aaa ggc tac gct gcc aac tac tgt gat gga gag	1104
Trp Ile Ile Ala Pro Lys Gly Tyr Ala Ala Asn Tyr Cys Asp Gly Glu	
355 360 365	
tgt tcc ttc cca ctc aac gca cac atg aat gcc acc aac cac gcc att	1152
Cys Ser Phe Pro Leu Asn Ala His Met Asn Ala Thr Asn His Ala Ile	
370 375 380	
gta cag acc ttg gtc cac ctt atg aat ccc gag tac gtc ccc aaa cca	1200
Val Gln Thr Leu Val His Leu Met Asn Pro Glu Tyr Val Pro Lys Pro	
385 390 395 400	
tgc tgc gca cca acc aaa ctg aat gcc atc tcg gtt ctt tac ttc gat	1248
Cys Cys Ala Pro Thr Lys Leu Asn Ala Ile Ser Val Leu Tyr Phe Asp	
405 410 415	
gat aac tcc aat gtc atc ttg aaa aag tac agg aat atg gtc gtg aga	1296

Asp Asn Ser Asn Val Ile Leu Lys Lys Tyr Arg Asn Met Val Val Arg  
 420 425 430

gct tgt ggt tgc cat taagttgaag ctggtgtgtg tgtgtgggtg ggggcatggt 1351  
 Ala Cys Gly Cys His  
 435

tctgccttgg a 1362

<210> 4  
 <211> 437  
 <212> PRT  
 <213> mouse

<220>  
 <221> UNSURE  
 <222> (186)  
 <223> Xaa at position 186 is Tyr or His

<400> 4

Met Ala Arg Leu Met Ile Pro Gly Asn Arg Met Leu Met Val Val Leu  
 1 5 10 15

Leu Cys Gln Val Leu Leu Gly Gly Ala Ser His Ala Ser Leu Ile Pro  
 20 25 30

Glu Thr Gly Lys Lys Lys Val Ala Glu Ile Gln Gly His Ala Gly Gly  
 35 40 45

Arg Arg Ser Gly Gln Ser His Glu Leu Leu Arg Asp Phe Glu Ala Thr  
 50 55 60

Leu Leu Gln Met Phe Gly Leu Arg Arg Arg Pro Gln Pro Ser Lys Ser  
 65 70 75 80

Ala Val Ile Pro Asp Tyr Met Arg Asp Leu Tyr Arg Leu Gln Ser Gly  
85 90 95

Glu Glu Glu Glu Glu Glu Gln Ser Gln Gly Thr Gly Leu Glu Tyr Pro  
100 105 110

Glu Arg Pro Ala Ser Arg Ala Asn Thr Val Arg Ser Phe His His Glu  
115 120 125

Glu His Leu Glu Asn Ile Pro Gly Thr Ser Glu Ser Ser Ala Phe Arg  
130 135 140

Phe Leu Phe Asn Leu Ser Ser Ile Pro Glu Asn Glu Val Ile Ser Ser  
145 150 155 160

Ala Glu Leu Arg Leu Phe Arg Glu Gln Val Asp Gln Gly Pro Asp Trp  
165 170 175

Glu Gln Gly Phe His Arg Ile Asn Ile Xaa Glu Val Met Lys Pro Pro  
180 185 190

Ala Glu Met Val Pro Gly His Leu Ile Thr Arg Leu Leu Asp Thr Arg  
195 200 205

Leu Val His His Asn Val Thr Arg Trp Glu Thr Phe Asp Val Ser Pro  
210 215 220

Ala Val Leu Arg Trp Thr Arg Glu Lys Gln Pro Asn Tyr Gly Leu Ala  
225 230 235 240

Ile Glu Val Thr His Leu His Gln Thr Arg Thr His Gln Gly Gln His  
245 250 255

Val Arg Ile Ser Arg Ser Leu Pro Gln Gly Ser Gly Asp Trp Ala Gln  
260 265 270

Leu Arg Pro Leu Leu Val Thr Phe Gly His Asp Gly Arg Gly His Thr  
275 280 285

Leu Thr Arg Arg Arg Ala Lys Arg Ser Pro Lys Thr Arg Gln Glu Glu  
290 295 300

Glu Tyr Met Pro Met Glu Thr Arg Thr Gln Ser Gln Asp Val Ser Arg  
305 310 315 320

Gly Ser Gly Ser Ser Asp Tyr Asn Gly Ser Glu Leu Lys Thr Ala Cys  
325 330 335

Lys Lys His Glu Leu Tyr Val Ser Phe Gln Asp Leu Gly Trp Gln Asp  
340 345 350

Trp Ile Ile Ala Pro Lys Gly Tyr Ala Ala Asn Tyr Cys Asp Gly Glu  
355 360 365

Cys Ser Phe Pro Leu Asn Ala His Met Asn Ala Thr Asn His Ala Ile  
370 375 380

Val Gln Thr Leu Val His Leu Met Asn Pro Glu Tyr Val Pro Lys Pro  
385 390 395 400

Cys Cys Ala Pro Thr Lys Leu Asn Ala Ile Ser Val Leu Tyr Phe Asp  
405 410 415

Asp Asn Ser Asn Val Ile Leu Lys Lys Tyr Arg Asn Met Val Val Arg  
420 425 430

Ala Cys Gly Cys His  
435

<210> 5  
<211> 1289  
<212> DNA  
<213> mouse

<220>  
<221> CDS  
<222> (1)..(1281)

<220>  
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<222> (186)  
<223> Xaa at position 186 is Tyr or His

<400> 5  
atg gcg cgc ctg atg att cct ggt aac cga atg ctg atg gtc gtt tta 48  
Met Ala Arg Leu Met Ile Pro Gly Asn Arg Met Leu Met Val Val Leu  
1 5 10 15  
  
tta tgc caa gtc ctg cta gga ggc gcg agc cat gct agt ttg ata cct 96  
Leu Cys Gln Val Leu Leu Gly Gly Ala Ser His Ala Ser Leu Ile Pro  
20 25 30  
  
gag acc ggg aag aaa aaa gtc gcc gag att cag ggc cac gcg gga gga 144  
Glu Thr Gly Lys Lys Lys Val Ala Glu Ile Gln Gly His Ala Gly Gly  
35 40 45  
  
cgc cgc tca ggg cag agc cat gag ctc ctg cgg gac ttc gag gcg aca 192  
Arg Arg Ser Gly Gln Ser His Glu Leu Leu Arg Asp Phe Glu Ala Thr  
50 55 60  
  
ctt cta cag atg ttt ggg ctg cgc cgc cgt ccg cag cct agc aag agc 240  
Leu Leu Gln Met Phe Gly Leu Arg Arg Arg Pro Gln Pro Ser Lys Ser  
65 70 75 80  
  
gcc gtc att ccg gat tac atg agg gat ctt tac cgg ctc cag tct ggg 288

Ala	Val	Ile	Pro	Asp	Tyr	Met	Arg	Asp	Leu	Tyr	Arg	Leu	Gln	Ser	Gly		
				85					90					95			
gag	gag	gag	gag	gaa	gag	cag	agc	cag	gga	acc	ggg	ctt	gag	tac	ccg		336
Glu	Glu	Glu	Glu	Glu	Glu	Gln	Ser	Gln	Gly	Thr	Gly	Leu	Glu	Tyr	Pro		
			100					105					110				
gag	cgt	ccc	gcc	agc	cga	gcc	aac	act	gtg	agg	agt	ttc	cat	cac	gaa		384
Glu	Arg	Pro	Ala	Ser	Arg	Ala	Asn	Thr	Val	Arg	Ser	Phe	His	His	Glu		
		115					120					125					
gaa	cat	ctg	gag	aac	atc	cca	ggg	acc	agt	gag	agc	tct	gct	ttt	cgt		432
Glu	His	Leu	Glu	Asn	Ile	Pro	Gly	Thr	Ser	Glu	Ser	Ser	Ala	Phe	Arg		
		130				135					140						
ttc	ctc	ttc	aac	ctc	agc	agc	atc	cca	gaa	aat	gag	gtg	atc	tcc	tcg		480
Phe	Leu	Phe	Asn	Leu	Ser	Ser	Ile	Pro	Glu	Asn	Glu	Val	Ile	Ser	Ser		
145				150					155						160		
gca	gag	ctc	cgg	ctc	ttt	cgg	gag	cag	gtg	gac	cag	ggc	cct	gac	tgg		528
Ala	Glu	Leu	Arg	Leu	Phe	Arg	Glu	Gln	Val	Asp	Gln	Gly	Pro	Asp	Trp		
			165					170					175				
gaa	cag	ggc	ttc	cac	cgt	ata	aac	att	yat	gag	gtt	atg	aag	ccc	cca		576
Glu	Gln	Gly	Phe	His	Arg	Ile	Asn	Ile	Xaa	Glu	Val	Met	Lys	Pro	Pro		
			180				185						190				
gca	gaa	atg	gtt	cct	gga	cac	ctc	atc	aca	cga	cta	ctg	gac	acc	aga		624
Ala	Glu	Met	Val	Pro	Gly	His	Leu	Ile	Thr	Arg	Leu	Leu	Asp	Thr	Arg		
		195					200					205					
cta	gtc	cat	cac	aat	gtg	aca	cgg	tgg	gaa	act	ttc	gat	gtg	agc	cct		672
Leu	Val	His	His	Asn	Val	Thr	Arg	Trp	Glu	Thr	Phe	Asp	Val	Ser	Pro		
		210				215					220						
gca	gtc	ctt	cgc	tgg	acc	cgg	gaa	aag	caa	ccc	aat	tat	ggg	ctg	gcc		720
Ala	Val	Leu	Arg	Trp	Thr	Arg	Glu	Lys	Gln	Pro	Asn	Tyr	Gly	Leu	Ala		
225					230				235					240			
att	gag	gtg	act	cac	ctc	cac	cag	aca	cgg	acc	cac	cag	ggc	cag	cat		768

Ile Glu Val Thr His Leu His Gln Thr Arg Thr His Gln Gly Gln His	
245 250 255	
gtc aga atc agc cga tcg tta cct caa ggg agt gga gat tgg gcc caa	816
Val Arg Ile Ser Arg Ser Leu Pro Gln Gly Ser Gly Asp Trp Ala Gln	
260 265 270	
ctc cgg ccc ctc ctg gtc act ttt ggc cat gat ggc cgg ggc cat acc	864
Leu Arg Pro Leu Leu Val Thr Phe Gly His Asp Gly Arg Gly His Thr	
275 280 285	
ttg acc cgc agg agg gcc aaa cgt agt ccc aag cat cac cca cag cgg	912
Leu Thr Arg Arg Arg Ala Lys Arg Ser Pro Lys His His Pro Gln Arg	
290 295 300	
tcc acg cgc cag gag cag aag ctt atc tcg gag gag gac ctg acg cgt	960
Ser Thr Arg Gln Glu Gln Lys Leu Ile Ser Glu Glu Asp Leu Thr Arg	
305 310 315 320	
agg aag aag aat aag aac tgc cgt cgc cat tca cta tac gtg gac ttc	1008
Arg Lys Lys Asn Lys Asn Cys Arg Arg His Ser Leu Tyr Val Asp Phe	
325 330 335	
agt gac gtg ggc tgg aat gat tgg att gtg gcc cca ccc ggc tac cag	1056
Ser Asp Val Gly Trp Asn Asp Trp Ile Val Ala Pro Pro Gly Tyr Gln	
340 345 350	
gcc ttc tac tgc cat ggg gac tgt ccc ttt cca ctg gct gat cac ctc	1104
Ala Phe Tyr Cys His Gly Asp Cys Pro Phe Pro Leu Ala Asp His Leu	
355 360 365	
aac tca acc aac cat gcc att gtg cag acc cta gtc aac tct gtt aat	1152
Asn Ser Thr Asn His Ala Ile Val Gln Thr Leu Val Asn Ser Val Asn	
370 375 380	
tct agt atc cct aag gcc tgt tgt gtc ccc act gaa ctg agt gcc att	1200
Ser Ser Ile Pro Lys Ala Cys Cys Val Pro Thr Glu Leu Ser Ala Ile	
385 390 395 400	
tcc atg ttg tac ctg gat gag tat gac aag gtg gtg ttg aaa aat tat	1248

Ser Met Leu Tyr Leu Asp Glu Tyr Asp Lys Val Val Leu Lys Asn Tyr  
405 410 415

cag gag atg gtg gta gag ggg tgt gga tgc cgc tgacgcgt 1289  
Gln Glu Met Val Val Glu Gly Cys Gly Cys Arg  
420 425

<210> 6  
<211> 427  
<212> PRT  
<213> mouse

<220>  
<221> UNSURE  
<222> (186)  
<223> Xaa at position 186 is Tyr or His

<400> 6

Met Ala Arg Leu Met Ile Pro Gly Asn Arg Met Leu Met Val Val Leu  
1 5 10 15

Leu Cys Gln Val Leu Leu Gly Gly Ala Ser His Ala Ser Leu Ile Pro  
20 25 30

Glu Thr Gly Lys Lys Lys Val Ala Glu Ile Gln Gly His Ala Gly Gly  
35 40 45

Arg Arg Ser Gly Gln Ser His Glu Leu Leu Arg Asp Phe Glu Ala Thr  
50 55 60

Leu Leu Gln Met Phe Gly Leu Arg Arg Arg Pro Gln Pro Ser Lys Ser  
65 70 75 80



Ala Val Ile Pro Asp Tyr Met Arg Asp Leu Tyr Arg Leu Gln Ser Gly  
85 90 95

Glu Glu Glu Glu Glu Glu Gln Ser Gln Gly Thr Gly Leu Glu Tyr Pro  
100 105 110

Glu Arg Pro Ala Ser Arg Ala Asn Thr Val Arg Ser Phe His His Glu  
115 120 125

Glu His Leu Glu Asn Ile Pro Gly Thr Ser Glu Ser Ser Ala Phe Arg  
130 135 140

Phe Leu Phe Asn Leu Ser Ser Ile Pro Glu Asn Glu Val Ile Ser Ser  
145 150 155 160

Ala Glu Leu Arg Leu Phe Arg Glu Gln Val Asp Gln Gly Pro Asp Trp  
165 170 175

Glu Gln Gly Phe His Arg Ile Asn Ile Xaa Glu Val Met Lys Pro Pro  
180 185 190

Ala Glu Met Val Pro Gly His Leu Ile Thr Arg Leu Leu Asp Thr Arg  
195 200 205

Leu Val His His Asn Val Thr Arg Trp Glu Thr Phe Asp Val Ser Pro  
210 215 220

Ala Val Leu Arg Trp Thr Arg Glu Lys Gln Pro Asn Tyr Gly Leu Ala  
225 230 235 240

Ile Glu Val Thr His Leu His Gln Thr Arg Thr His Gln Gly Gln His  
245 250 255

Val Arg Ile Ser Arg Ser Leu Pro Gln Gly Ser Gly Asp Trp Ala Gln  
260 265 270

Leu Arg Pro Leu Leu Val Thr Phe Gly His Asp Gly Arg Gly His Thr  
275 280 285

Leu Thr Arg Arg Arg Ala Lys Arg Ser Pro Lys His His Pro Gln Arg  
290 295 300

Ser Thr Arg Gln Glu Gln Lys Leu Ile Ser Glu Glu Asp Leu Thr Arg  
305 310 315 320

Arg Lys Lys Asn Lys Asn Cys Arg Arg His Ser Leu Tyr Val Asp Phe  
325 330 335

Ser Asp Val Gly Trp Asn Asp Trp Ile Val Ala Pro Pro Gly Tyr Gln  
340 345 350

Ala Phe Tyr Cys His Gly Asp Cys Pro Phe Pro Leu Ala Asp His Leu  
355 360 365

Asn Ser Thr Asn His Ala Ile Val Gln Thr Leu Val Asn Ser Val Asn  
370 375 380

Ser Ser Ile Pro Lys Ala Cys Cys Val Pro Thr Glu Leu Ser Ala Ile  
385 390 395 400

Ser Met Leu Tyr Leu Asp Glu Tyr Asp Lys Val Val Leu Lys Asn Tyr  
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Gln Glu Met Val Val Glu Gly Cys Gly Cys Arg  
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 ctc tgg gcg cct ctg ttc ttg ctg cgc tcc gcc ctg gcc gat ttc agc 96  
 Leu Trp Ala Pro Leu Phe Leu Leu Arg Ser Ala Leu Ala Asp Phe Ser  
 20 25 30  
 ctg gac aac gag gtg cac tcc agc ttc atc cac cgg cgc ctc cgc agc 144  
 Leu Asp Asn Glu Val His Ser Ser Phe Ile His Arg Arg Leu Arg Ser  
 35 40 45  
 cag gag cgg cgg gag atg cag cgg gag atc ctg tcc atc tta ggg ttg 192  
 Gln Glu Arg Arg Glu Met Gln Arg Glu Ile Leu Ser Ile Leu Gly Leu  
 50 55 60  
 ccc cat cgc ccg cgc ccg cac ctc cag gga aag cat aat tcg gcg ccc 240  
 Pro His Arg Pro Arg Pro His Leu Gln Gly Lys His Asn Ser Ala Pro  
 65 70 75 80  
 atg ttc atg ttg gac ctg tac aac gcc atg gcg gtg gag gag agc ggg 288  
 Met Phe Met Leu Asp Leu Tyr Asn Ala Met Ala Val Glu Glu Ser Gly  
 85 90 95  
 ccg gac gga cag ggc ttc tcc tac ccc tac aag gcc gtc ttc agt acc 336  
 Pro Asp Gly Gln Gly Phe Ser Tyr Pro Tyr Lys Ala Val Phe Ser Thr  
 100 105 110  
 cag ggc ccc cct tta gcc agc ctg cag gac agc cac ttc ctc act gac 384  
 Gln Gly Pro Pro Leu Ala Ser Leu Gln Asp Ser His Phe Leu Thr Asp  
 115 120 125

gcc gac atg gtc atg agc ttc gtc aac cta gtg gaa cat gac aaa gaa	432
Ala Asp Met Val Met Ser Phe Val Asn Leu Val Glu His Asp Lys Glu	
130 135 140	
ttc ttc cac cct cga tac cac cat cgg gag ttc cgg ttt gat ctt tcc	480
Phe Phe His Pro Arg Tyr His His Arg Glu Phe Arg Phe Asp Leu Ser	
145 150 155 160	
aag atc ccc gag ggc gaa cgg gtg acc gca gcc gaa ttc agg atc tat	528
Lys Ile Pro Glu Gly Glu Arg Val Thr Ala Ala Glu Phe Arg Ile Tyr	
165 170 175	
aag gac tac atc cgg gag cga ttt gac aac gag acc ttc cag atc aca	576
Lys Asp Tyr Ile Arg Glu Arg Phe Asp Asn Glu Thr Phe Gln Ile Thr	
180 185 190	
gtc tat cag gtg ctc cag gag cac tca ggc agg gag tcg gac ctc ttc	624
Val Tyr Gln Val Leu Gln Glu His Ser Gly Arg Glu Ser Asp Leu Phe	
195 200 205	
ttg ctg gac agc cgc acc atc tgg gct tct gag gag ggc tgg ttg gtg	672
Leu Leu Asp Ser Arg Thr Ile Trp Ala Ser Glu Glu Gly Trp Leu Val	
210 215 220	
ttt gat atc aca gcc acc agc aac cac tgg gtg gtc aac cct cgg cac	720
Phe Asp Ile Thr Ala Thr Ser Asn His Trp Val Val Asn Pro Arg His	
225 230 235 240	
aac ctg ggc tta cag ctc tct gtg gag acc ctg gat ggg cag agc atc	768
Asn Leu Gly Leu Gln Leu Ser Val Glu Thr Leu Asp Gly Gln Ser Ile	
245 250 255	
aac ccc aag ttg gca ggc ctg att gga cgg cat gga ccc cag aac aag	816
Asn Pro Lys Leu Ala Gly Leu Ile Gly Arg His Gly Pro Gln Asn Lys	
260 265 270	
caa ccc ttc atg gtg gcc ttc ttc aag gcc acg gaa gtc cat ctc cgt	864
Gln Pro Phe Met Val Ala Phe Phe Lys Ala Thr Glu Val His Leu Arg	
275 280 285	
agt atc cgg tcc acg ggg ggc acg cgc cag gag gag gaa tac atg ccc	912

Ser	Ile	Arg	Ser	Thr	Gly	Gly	Thr	Arg	Gln	Glu	Glu	Glu	Tyr	Met	Pro	
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atg	gag	acg	cgt	acc	cag	tcg	cag	gac	gtg	tcc	cgg	ggc	tcc	ggg	tct	960
Met	Glu	Thr	Arg	Thr	Gln	Ser	Gln	Asp	Val	Ser	Arg	Gly	Ser	Gly	Ser	
305					310				315						320	
tca	gac	tac	aac	ggc	agt	gag	tta	aaa	aca	gct	tgc	aag	aag	cat	gag	1008
Ser	Asp	Tyr	Asn	Gly	Ser	Glu	Leu	Lys	Thr	Ala	Cys	Lys	Lys	His	Glu	
				325					330					335		
ctc	tat	gtg	agc	ttc	cag	gac	ctg	gga	tgg	cag	gac	tgg	atc	att	gca	1056
Leu	Tyr	Val	Ser	Phe	Gln	Asp	Leu	Gly	Trp	Gln	Asp	Trp	Ile	Ile	Ala	
			340					345					350			
ccc	aaa	ggc	tac	gct	gcc	aac	tac	tgt	gat	gga	gag	tgt	tcc	ttc	cca	1104
Pro	Lys	Gly	Tyr	Ala	Ala	Asn	Tyr	Cys	Asp	Gly	Glu	Cys	Ser	Phe	Pro	
		355					360					365				
ctc	aac	gca	cac	atg	aat	gcc	acc	aac	cac	gcc	att	gta	cag	acc	ttg	1152
Leu	Asn	Ala	His	Met	Asn	Ala	Thr	Asn	His	Ala	Ile	Val	Gln	Thr	Leu	
	370					375					380					
gtc	cac	ctt	atg	aat	ccc	gag	tac	gtc	ccc	aaa	cca	tgc	tgc	gca	cca	1200
Val	His	Leu	Met	Asn	Pro	Glu	Tyr	Val	Pro	Lys	Pro	Cys	Cys	Ala	Pro	
385					390					395					400	
acc	aaa	ctg	aat	gcc	atc	tcg	gtt	ctt	tac	ttc	gat	gat	aac	tcc	aat	1248
Thr	Lys	Leu	Asn	Ala	Ile	Ser	Val	Leu	Tyr	Phe	Asp	Asp	Asn	Ser	Asn	
				405					410					415		
gtc	atc	ttg	aaa	aag	tac	agg	aat	atg	gtc	gtg	aga	gct	tgt	ggg	tgc	1296
Val	Ile	Leu	Lys	Lys	Tyr	Arg	Asn	Met	Val	Val	Arg	Ala	Cys	Gly	Cys	
			420					425					430			
cat	taagttgaag	ctggtgtgtg	tgtgtgggtg	ggggcatggt	tctgccttgg	a										1350
His																

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<400> 8

Met His Val Arg Ser Leu Arg Ala Ala Ala Pro His Ser Phe Val Ala  
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Leu Trp Ala Pro Leu Phe Leu Leu Arg Ser Ala Leu Ala Asp Phe Ser  
20 25 30

Leu Asp Asn Glu Val His Ser Ser Phe Ile His Arg Arg Leu Arg Ser  
35 40 45

Gln Glu Arg Arg Glu Met Gln Arg Glu Ile Leu Ser Ile Leu Gly Leu  
50 55 60

Pro His Arg Pro Arg Pro His Leu Gln Gly Lys His Asn Ser Ala Pro  
65 70 75 80

Met Phe Met Leu Asp Leu Tyr Asn Ala Met Ala Val Glu Glu Ser Gly  
85 90 95

Pro Asp Gly Gln Gly Phe Ser Tyr Pro Tyr Lys Ala Val Phe Ser Thr  
100 105 110

Gln Gly Pro Pro Leu Ala Ser Leu Gln Asp Ser His Phe Leu Thr Asp  
115 120 125

Ala Asp Met Val Met Ser Phe Val Asn Leu Val Glu His Asp Lys Glu  
130 135 140

Phe Phe His Pro Arg Tyr His His Arg Glu Phe Arg Phe Asp Leu Ser  
145 150 155 160

Lys Ile Pro Glu Gly Glu Arg Val Thr Ala Ala Glu Phe Arg Ile Tyr  
165 170 175

Lys Asp Tyr Ile Arg Glu Arg Phe Asp Asn Glu Thr Phe Gln Ile Thr  
180 185 190

Val Tyr Gln Val Leu Gln Glu His Ser Gly Arg Glu Ser Asp Leu Phe  
195 200 205

Leu Leu Asp Ser Arg Thr Ile Trp Ala Ser Glu Glu Gly Trp Leu Val  
210 215 220

Phe Asp Ile Thr Ala Thr Ser Asn His Trp Val Val Asn Pro Arg His  
225 230 235 240

Asn Leu Gly Leu Gln Leu Ser Val Glu Thr Leu Asp Gly Gln Ser Ile  
245 250 255

Asn Pro Lys Leu Ala Gly Leu Ile Gly Arg His Gly Pro Gln Asn Lys  
260 265 270

Gln Pro Phe Met Val Ala Phe Phe Lys Ala Thr Glu Val His Leu Arg  
275 280 285

Ser Ile Arg Ser Thr Gly Gly Thr Arg Gln Glu Glu Glu Tyr Met Pro  
290 295 300

Met Glu Thr Arg Thr Gln Ser Gln Asp Val Ser Arg Gly Ser Gly Ser  
305 310 315 320

Ser Asp Tyr Asn Gly Ser Glu Leu Lys Thr Ala Cys Lys Lys His Glu  
325 330 335

Leu Tyr Val Ser Phe Gln Asp Leu Gly Trp Gln Asp Trp Ile Ile Ala  
340 345 350

Pro Lys Gly Tyr Ala Ala Asn Tyr Cys Asp Gly Glu Cys Ser Phe Pro  
355 360 365

Leu Asn Ala His Met Asn Ala Thr Asn His Ala Ile Val Gln Thr Leu  
370 375 380

Val His Leu Met Asn Pro Glu Tyr Val Pro Lys Pro Cys Cys Ala Pro  
385 390 395 400

Thr Lys Leu Asn Ala Ile Ser Val Leu Tyr Phe Asp Asp Asn Ser Asn  
405 410 415

Val Ile Leu Lys Lys Tyr Arg Asn Met Val Val Arg Ala Cys Gly Cys  
420 425 430

His

<210> 9

<211> 1353

<212> DNA

<213> mouse

<220>

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<222> (1) .. (1353)



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Met His Val Arg Ser Leu Arg Ala Ala Ala Pro His Ser Phe Val Ala	
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ctc tgg gcg cct ctg ttc ttg ctg cgc tcc gcc ctg gcc gat ttc agc	96
Leu Trp Ala Pro Leu Phe Leu Leu Arg Ser Ala Leu Ala Asp Phe Ser	
20 25 30	
ctg gac aac gag gtg cac tcc agc ttc atc cac cgg cgc ctc cgc agc	144
Leu Asp Asn Glu Val His Ser Ser Phe Ile His Arg Arg Leu Arg Ser	
35 40 45	
cag gag cgg cgg gag atg cag cgg gag atc ctg tcc atc tta ggg ttg	192
Gln Glu Arg Arg Glu Met Gln Arg Glu Ile Leu Ser Ile Leu Gly Leu	
50 55 60	
ccc cat cgc ccg cgc ccg cac ctc cag gga aag cat aat tgc gcg ccc	240
Pro His Arg Pro Arg Pro His Leu Gln Gly Lys His Asn Ser Ala Pro	
65 70 75 80	
atg ttc atg ttg gac ctg tac aac gcc atg gcg gtg gag gag agc ggg	288
Met Phe Met Leu Asp Leu Tyr Asn Ala Met Ala Val Glu Glu Ser Gly	
85 90 95	
ccg gac gga cag ggc ttc tcc tac ccc tac aag gcc gtc ttc agt acc	336
Pro Asp Gly Gln Gly Phe Ser Tyr Pro Tyr Lys Ala Val Phe Ser Thr	
100 105 110	
cag ggc ccc cct tta gcc agc ctg cag gac agc cac ttc ctc act gac	384
Gln Gly Pro Pro Leu Ala Ser Leu Gln Asp Ser His Phe Leu Thr Asp	
115 120 125	
gcc gac atg gtc atg agc ttc gtc aac cta gtg gaa cat gac aaa gaa	432
Ala Asp Met Val Met Ser Phe Val Asn Leu Val Glu His Asp Lys Glu	
130 135 140	
ttc ttc cac cct cga tac cac cat cgg gag ttc cgg ttt gat ctt tcc	480
Phe Phe His Pro Arg Tyr His His Arg Glu Phe Arg Phe Asp Leu Ser	
145 150 155 160	

aag atc ccc gag ggc gaa cgg gtg acc gca gcc gaa ttc agg atc tat	528
Lys Ile Pro Glu Gly Glu Arg Val Thr Ala Ala Glu Phe Arg Ile Tyr	
165 170 175	
aag gac tac atc cgg gag cga ttt gac aac gag acc ttc cag atc aca	576
Lys Asp Tyr Ile Arg Glu Arg Phe Asp Asn Glu Thr Phe Gln Ile Thr	
180 185 190	
gtc tat cag gtg ctc cag gag cac tca ggc agg gag tcg gac ctc ttc	624
Val Tyr Gln Val Leu Gln Glu His Ser Gly Arg Glu Ser Asp Leu Phe	
195 200 205	
ttg ctg gac agc cgc acc atc tgg gct tct gag gag ggc tgg ttg gtg	672
Leu Leu Asp Ser Arg Thr Ile Trp Ala Ser Glu Glu Gly Trp Leu Val	
210 215 220	
ttt gat atc aca gcc acc agc aac cac tgg gtg gtc aac cct cgg cac	720
Phe Asp Ile Thr Ala Thr Ser Asn His Trp Val Val Asn Pro Arg His	
225 230 235 240	
aac ctg ggc tta cag ctc tct gtg gag acc ctg gat ggg cag agc atc	768
Asn Leu Gly Leu Gln Leu Ser Val Glu Thr Leu Asp Gly Gln Ser Ile	
245 250 255	
aac ccc aag ttg gca ggc ctg att gga cgg cat gga ccc cag aac aag	816
Asn Pro Lys Leu Ala Gly Leu Ile Gly Arg His Gly Pro Gln Asn Lys	
260 265 270	
caa ccc ttc atg gtg gcc ttc ttc aag gcc acg gaa gtc cat ctc cgt	864
Gln Pro Phe Met Val Ala Phe Phe Lys Ala Thr Glu Val His Leu Arg	
275 280 285	
agt atc cgg tcc acg ggg ggc acg cgc cag gag cag aag ctt atc tcg	912
Ser Ile Arg Ser Thr Gly Gly Thr Arg Gln Glu Gln Lys Leu Ile Ser	
290 295 300	
gag gag gac ctg acg cgt acc cag tcg cag gac gtg tcc cgg ggc tcc	960
Glu Glu Asp Leu Thr Arg Thr Gln Ser Gln Asp Val Ser Arg Gly Ser	
305 310 315 320	
ggc tct tca gac tac aac ggc agt gag tta aaa aca gct tgc aag aag	1008

Gly Ser Ser Asp Tyr Asn Gly Ser Glu Leu Lys Thr Ala Cys Lys Lys	
325 330 335	
cat gag ctc tat gtg agc ttc cag gac ctg gga tgg cag gac tgg atc	1056
His Glu Leu Tyr Val Ser Phe Gln Asp Leu Gly Trp Gln Asp Trp Ile	
340 345 350	
att gca ccc aaa ggc tac gct gcc aac tac tgt gat gga gag tgt tcc	1104
Ile Ala Pro Lys Gly Tyr Ala Ala Asn Tyr Cys Asp Gly Glu Cys Ser	
355 360 365	
ttc cca ctc aac gca cac atg aat gcc acc aac cac gcc att gta cag	1152
Phe Pro Leu Asn Ala His Met Asn Ala Thr Asn His Ala Ile Val Gln	
370 375 380	
acc ttg gtc cac ctt atg aat ccc gag tac gtc ccc aaa cca tgc tgc	1200
Thr Leu Val His Leu Met Asn Pro Glu Tyr Val Pro Lys Pro Cys Cys	
385 390 395 400	
gca cca acc aaa ctg aat gcc atc tcg gtt ctt tac ttc gat gat aac	1248
Ala Pro Thr Lys Leu Asn Ala Ile Ser Val Leu Tyr Phe Asp Asp Asn	
405 410 415	
tcc aat gtc atc ttg aaa aag tac agg aat atg gtc gtg aga gct tgt	1296
Ser Asn Val Ile Leu Lys Lys Tyr Arg Asn Met Val Val Arg Ala Cys	
420 425 430	
ggc tgc cat gtt gaa gct ggt gtg tgt gtg tgg gtg ggg gca tgg ttc	1344
Gly Cys His Val Glu Ala Gly Val Cys Val Trp Val Gly Ala Trp Phe	
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tgc ctt gga	1353
Cys Leu Gly	
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Met His Val Arg Ser Leu Arg Ala Ala Ala Pro His Ser Phe Val Ala  
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Leu Trp Ala Pro Leu Phe Leu Leu Arg Ser Ala Leu Ala Asp Phe Ser  
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Leu Asp Asn Glu Val His Ser Ser Phe Ile His Arg Arg Leu Arg Ser  
35 40 45

Gln Glu Arg Arg Glu Met Gln Arg Glu Ile Leu Ser Ile Leu Gly Leu  
50 55 60

Pro His Arg Pro Arg Pro His Leu Gln Gly Lys His Asn Ser Ala Pro  
65 70 75 80

Met Phe Met Leu Asp Leu Tyr Asn Ala Met Ala Val Glu Glu Ser Gly  
85 90 95

Pro Asp Gly Gln Gly Phe Ser Tyr Pro Tyr Lys Ala Val Phe Ser Thr  
100 105 110

Gln Gly Pro Pro Leu Ala Ser Leu Gln Asp Ser His Phe Leu Thr Asp  
115 120 125

Ala Asp Met Val Met Ser Phe Val Asn Leu Val Glu His Asp Lys Glu  
130 135 140

Phe Phe His Pro Arg Tyr His His Arg Glu Phe Arg Phe Asp Leu Ser  
145 150 155 160

Lys Ile Pro Glu Gly Glu Arg Val Thr Ala Ala Glu Phe Arg Ile Tyr  
165 170 175

Lys Asp Tyr Ile Arg Glu Arg Phe Asp Asn Glu Thr Phe Gln Ile Thr  
180 185 190

Val Tyr Gln Val Leu Gln Glu His Ser Gly Arg Glu Ser Asp Leu Phe  
195 200 205

Leu Leu Asp Ser Arg Thr Ile Trp Ala Ser Glu Glu Gly Trp Leu Val  
210 215 220

Phe Asp Ile Thr Ala Thr Ser Asn His Trp Val Val Asn Pro Arg His  
225 230 235 240

Asn Leu Gly Leu Gln Leu Ser Val Glu Thr Leu Asp Gly Gln Ser Ile  
245 250 255

Asn Pro Lys Leu Ala Gly Leu Ile Gly Arg His Gly Pro Gln Asn Lys  
260 265 270

Gln Pro Phe Met Val Ala Phe Phe Lys Ala Thr Glu Val His Leu Arg  
275 280 285

Ser Ile Arg Ser Thr Gly Gly Thr Arg Gln Glu Gln Lys Leu Ile Ser  
290 295 300

Glu Glu Asp Leu Thr Arg Thr Gln Ser Gln Asp Val Ser Arg Gly Ser  
305 310 315 320

Gly Ser Ser Asp Tyr Asn Gly Ser Glu Leu Lys Thr Ala Cys Lys Lys  
325 330 335

His Glu Leu Tyr Val Ser Phe Gln Asp Leu Gly Trp Gln Asp Trp Ile  
340 345 350

Ile Ala Pro Lys Gly Tyr Ala Ala Asn Tyr Cys Asp Gly Glu Cys Ser  
355 360 365

Phe Pro Leu Asn Ala His Met Asn Ala Thr Asn His Ala Ile Val Gln  
370 375 380

Thr Leu Val His Leu Met Asn Pro Glu Tyr Val Pro Lys Pro Cys Cys  
385 390 395 400

Ala Pro Thr Lys Leu Asn Ala Ile Ser Val Leu Tyr Phe Asp Asp Asn  
405 410 415

Ser Asn Val Ile Leu Lys Lys Tyr Arg Asn Met Val Val Arg Ala Cys  
420 425 430

Gly Cys His Val Glu Ala Gly Val Cys Val Trp Val Gly Ala Trp Phe  
435 440 445

Cys Leu Gly  
450

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Lys Ile Pro Glu Gly Glu Arg Val Thr Ala Ala Glu Phe Arg Ile Tyr	
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aag gac tac atc cgg gag cga ttt gac aac gag acc ttc cag atc aca	576
Lys Asp Tyr Ile Arg Glu Arg Phe Asp Asn Glu Thr Phe Gln Ile Thr	
180 185 190	
gtc tat cag gtg ctc cag gag cac tca ggc agg gag tcg gac ctc ttc	624
Val Tyr Gln Val Leu Gln Glu His Ser Gly Arg Glu Ser Asp Leu Phe	
195 200 205	
ttg ctg gac agc cgc acc atc tgg gct tct gag gag ggc tgg ttg gtg	672
Leu Leu Asp Ser Arg Thr Ile Trp Ala Ser Glu Glu Gly Trp Leu Val	
210 215 220	
ttt gat atc aca gcc acc agc aac cac tgg gtg gtc aac cct cgg cac	720
Phe Asp Ile Thr Ala Thr Ser Asn His Trp Val Val Asn Pro Arg His	
225 230 235 240	
aac ctg ggc tta cag ctc tct gtg gag acc ctg gat ggg cag agc atc	768
Asn Leu Gly Leu Gln Leu Ser Val Glu Thr Leu Asp Gly Gln Ser Ile	
245 250 255	
aac ccc aag ttg gca ggc ctg att gga cgg cat gga ccc cag aac aag	816
Asn Pro Lys Leu Ala Gly Leu Ile Gly Arg His Gly Pro Gln Asn Lys	
260 265 270	
caa ccc ttc atg gtg gcc ttc ttc aag gcc acg gaa gtc cat ctc cgt	864
Gln Pro Phe Met Val Ala Phe Phe Lys Ala Thr Glu Val His Leu Arg	
275 280 285	
agt atc cgg tcc acg ggg ggc acg cgc cag gag gag gaa tac atg ccc	912
Ser Ile Arg Ser Thr Gly Gly Thr Arg Gln Glu Glu Glu Tyr Met Pro	
290 295 300	
atg gag acg cgt cca aag aac caa gag gcc ctg agg atg gcc agt gtg	960
Met Glu Thr Arg Pro Lys Asn Gln Glu Ala Leu Arg Met Ala Ser Val	
305 310 315 320	
gca gaa aac agc agc agt gac cag agg cag gcc tgc aag aaa cat gag	1008





Leu Trp Ala Pro Leu Phe Leu Leu Arg Ser Ala Leu Ala Asp Phe Ser  
20 25 30

Leu Asp Asn Glu Val His Ser Ser Phe Ile His Arg Arg Leu Arg Ser  
35 40 45

Gln Glu Arg Arg Glu Met Gln Arg Glu Ile Leu Ser Ile Leu Gly Leu  
50 55 60

Pro His Arg Pro Arg Pro His Leu Gln Gly Lys His Asn Ser Ala Pro  
65 70 75 80

Met Phe Met Leu Asp Leu Tyr Asn Ala Met Ala Val Glu Glu Ser Gly  
85 90 95

Pro Asp Gly Gln Gly Phe Ser Tyr Pro Tyr Lys Ala Val Phe Ser Thr  
100 105 110

Gln Gly Pro Pro Leu Ala Ser Leu Gln Asp Ser His Phe Leu Thr Asp  
115 120 125

Ala Asp Met Val Met Ser Phe Val Asn Leu Val Glu His Asp Lys Glu  
130 135 140

Phe Phe His Pro Arg Tyr His His Arg Glu Phe Arg Phe Asp Leu Ser  
145 150 155 160

Lys Ile Pro Glu Gly Glu Arg Val Thr Ala Ala Glu Phe Arg Ile Tyr  
165 170 175

Lys Asp Tyr Ile Arg Glu Arg Phe Asp Asn Glu Thr Phe Gln Ile Thr  
180 185 190

Val Tyr Gln Val Leu Gln Glu His Ser Gly Arg Glu Ser Asp Leu Phe  
 195 200 205

Leu Leu Asp Ser Arg Thr Ile Trp Ala Ser Glu Glu Gly Trp Leu Val  
 210 215 220

Phe Asp Ile Thr Ala Thr Ser Asn His Trp Val Val Asn Pro Arg His  
 225 230 235 240

Asn Leu Gly Leu Gln Leu Ser Val Glu Thr Leu Asp Gly Gln Ser Ile  
 245 250 255

Asn Pro Lys Leu Ala Gly Leu Ile Gly Arg His Gly Pro Gln Asn Lys  
 260 265 270

Gln Pro Phe Met Val Ala Phe Phe Lys Ala Thr Glu Val His Leu Arg  
 275 280 285

Ser Ile Arg Ser Thr Gly Gly Thr Arg Gln Glu Glu Glu Tyr Met Pro  
 290 295 300

Met Glu Thr Arg Pro Lys Asn Gln Glu Ala Leu Arg Met Ala Ser Val  
 305 310 315 320

Ala Glu Asn Ser Ser Ser Asp Gln Arg Gln Ala Cys Lys Lys His Glu  
 325 330 335

Leu Tyr Val Ser Phe Arg Asp Leu Gly Trp Gln Asp Trp Ile Ile Ala  
 340 345 350

Pro Glu Gly Tyr Ala Ala Tyr Tyr Cys Glu Gly Glu Cys Ala Phe Pro  
 355 360 365

Leu Asn Ser Tyr Met Asn Ala Thr Asn His Ala Ile Val Gln Thr Leu  
 370 375 380

Val His Phe Ile Asn Pro Asp Thr Val Pro Lys Pro Cys Cys Ala Pro  
 385 390 395 400

Thr Gln Leu Asn Ala Ile Ser Val Leu Tyr Phe Asp Asp Ser Ser Asn  
 405 410 415

Val Ile Leu Lys Lys Tyr Arg Asn Met Val Val Arg Ala Cys Gly Cys  
 420 425 430

His

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 <212> DNA  
 <213> mouse

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 <222> (1)..(1305)

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 Leu Trp Ala Pro Leu Phe Leu Leu Arg Ser Ala Leu Ala Asp Phe Ser  
 20 25 30  
 ctg gac aac gag gtg cac tcc agc ttc atc cac cgg cgc ctc cgc agc 144  
 Leu Asp Asn Glu Val His Ser Ser Phe Ile His Arg Arg Leu Arg Ser  
 35 40 45

cag gag cgg cgg gag atg cag cgg gag atc ctg tcc atc tta ggg ttg	192
Gln Glu Arg Arg Glu Met Gln Arg Glu Ile Leu Ser Ile Leu Gly Leu	
50 55 60	
ccc cat cgc ccg cgc ccg cac ctc cag gga aag cat aat tcg gcg ccc	240
Pro His Arg Pro Arg Pro His Leu Gln Gly Lys His Asn Ser Ala Pro	
65 70 75 80	
atg ttc atg ttg gac ctg tac aac gcc atg gcg gtg gag gag agc ggg	288
Met Phe Met Leu Asp Leu Tyr Asn Ala Met Ala Val Glu Glu Ser Gly	
85 90 95	
ccg gac gga cag ggc ttc tcc tac ccc tac aag gcc gtc ttc agt acc	336
Pro Asp Gly Gln Gly Phe Ser Tyr Pro Tyr Lys Ala Val Phe Ser Thr	
100 105 110	
cag ggc ccc cct tta gcc agc ctg cag gac agc cac ttc ctc act gac	384
Gln Gly Pro Pro Leu Ala Ser Leu Gln Asp Ser His Phe Leu Thr Asp	
115 120 125	
gcc gac atg gtc atg agc ttc gtc aac cta gtg gaa cat gac aaa gaa	432
Ala Asp Met Val Met Ser Phe Val Asn Leu Val Glu His Asp Lys Glu	
130 135 140	
ttc ttc cac cct cga tac cac cat cgg gag ttc cgg ttt gat ctt tcc	480
Phe Phe His Pro Arg Tyr His His Arg Glu Phe Arg Phe Asp Leu Ser	
145 150 155 160	
aag atc ccc gag ggc gaa cgg gtg acc gca gcc gaa ttc agg atc tat	528
Lys Ile Pro Glu Gly Glu Arg Val Thr Ala Ala Glu Phe Arg Ile Tyr	
165 170 175	
aag gac tac atc cgg gag cga ttt gac aac gag acc ttc cag atc aca	576
Lys Asp Tyr Ile Arg Glu Arg Phe Asp Asn Glu Thr Phe Gln Ile Thr	
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Val Tyr Gln Val Leu Gln Glu His Ser Gly Arg Glu Ser Asp Leu Phe	
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Leu	Leu	Asp	Ser	Arg	Thr	Ile	Trp	Ala	Ser	Glu	Glu	Gly	Trp	Leu	Val		
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Phe	Asp	Ile	Thr	Ala	Thr	Ser	Asn	His	Trp	Val	Val	Asn	Pro	Arg	His		
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aac	ctg	ggc	tta	cag	ctc	tct	gtg	gag	acc	ctg	gat	ggg	cag	agc	atc	768	
Asn	Leu	Gly	Leu	Gln	Leu	Ser	Val	Glu	Thr	Leu	Asp	Gly	Gln	Ser	Ile		
			245					250					255				
aac	ccc	aag	ttg	gca	ggc	ctg	att	gga	cgg	cat	gga	ccc	cag	aac	aag	816	
Asn	Pro	Lys	Leu	Ala	Gly	Leu	Ile	Gly	Arg	His	Gly	Pro	Gln	Asn	Lys		
			260					265					270				
caa	ccc	ttc	atg	gtg	gcc	ttc	ttc	aag	gcc	acg	gaa	gtc	cat	ctc	cgt	864	
Gln	Pro	Phe	Met	Val	Ala	Phe	Phe	Lys	Ala	Thr	Glu	Val	His	Leu	Arg		
		275						280					285				
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Ser	Ile	Arg	Ser	Thr	Gly	Gly	Thr	Arg	Gln	Glu	Gln	Lys	Leu	Ile	Ser		
	290					295					300						
gag	gag	gac	ctg	acg	cgt	cca	aag	aac	caa	gag	gcc	ctg	agg	atg	gcc	960	
Glu	Glu	Asp	Leu	Thr	Arg	Pro	Lys	Asn	Gln	Glu	Ala	Leu	Arg	Met	Ala		
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Ser	Val	Ala	Glu	Asn	Ser	Ser	Ser	Asp	Gln	Arg	Gln	Ala	Cys	Lys	Lys		
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cat	gag	ctg	tac	gtc	agc	ttc	cga	gac	ctt	ggc	tgg	cag	gac	tgg	atc	1056	
His	Glu	Leu	Tyr	Val	Ser	Phe	Arg	Asp	Leu	Gly	Trp	Gln	Asp	Trp	Ile		
			340					345					350				
att	gca	cct	gaa	ggc	tat	gct	gcc	tac	tac	tgt	gag	gga	gag	tgc	gcc	1104	
Ile	Ala	Pro	Glu	Gly	Tyr	Ala	Ala	Tyr	Tyr	Cys	Glu	Gly	Glu	Cys	Ala		
		355					360					365					
ttc	cct	ctg	aac	tcc	tac	atg	aac	gcc	acc	aac	cac	gcc	atc	gtc	cag	1152	

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Thr Leu Val His Phe Ile Asn Pro Asp Thr Val Pro Lys Pro Cys Cys  
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Ala Pro Thr Gln Leu Asn Ala Ile Ser Val Leu Tyr Phe Asp Asp Ser  
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Ser Asn Val Ile Leu Lys Lys Tyr Arg Asn Met Val Val Arg Ala Cys  
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Gln Glu Arg Arg Glu Met Gln Arg Glu Ile Leu Ser Ile Leu Gly Leu  
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Pro His Arg Pro Arg Pro His Leu Gln Gly Lys His Asn Ser Ala Pro  
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Met Phe Met Leu Asp Leu Tyr Asn Ala Met Ala Val Glu Glu Ser Gly  
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Pro Asp Gly Gln Gly Phe Ser Tyr Pro Tyr Lys Ala Val Phe Ser Thr  
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Gln Gly Pro Pro Leu Ala Ser Leu Gln Asp Ser His Phe Leu Thr Asp  
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Ala Asp Met Val Met Ser Phe Val Asn Leu Val Glu His Asp Lys Glu  
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Phe Phe His Pro Arg Tyr His His Arg Glu Phe Arg Phe Asp Leu Ser  
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Lys Ile Pro Glu Gly Glu Arg Val Thr Ala Ala Glu Phe Arg Ile Tyr  
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Lys Asp Tyr Ile Arg Glu Arg Phe Asp Asn Glu Thr Phe Gln Ile Thr  
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Val Tyr Gln Val Leu Gln Glu His Ser Gly Arg Glu Ser Asp Leu Phe  
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Phe Asp Ile Thr Ala Thr Ser Asn His Trp Val Val Asn Pro Arg His  
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Asn Leu Gly Leu Gln Leu Ser Val Glu Thr Leu Asp Gly Gln Ser Ile  
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Asn Pro Lys Leu Ala Gly Leu Ile Gly Arg His Gly Pro Gln Asn Lys  
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Ser Ile Arg Ser Thr Gly Gly Thr Arg Gln Glu Gln Lys Leu Ile Ser  
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Glu Glu Asp Leu Thr Arg Pro Lys Asn Gln Glu Ala Leu Arg Met Ala  
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Ser Val Ala Glu Asn Ser Ser Ser Asp Gln Arg Gln Ala Cys Lys Lys  
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His Glu Leu Tyr Val Ser Phe Arg Asp Leu Gly Trp Gln Asp Trp Ile  
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